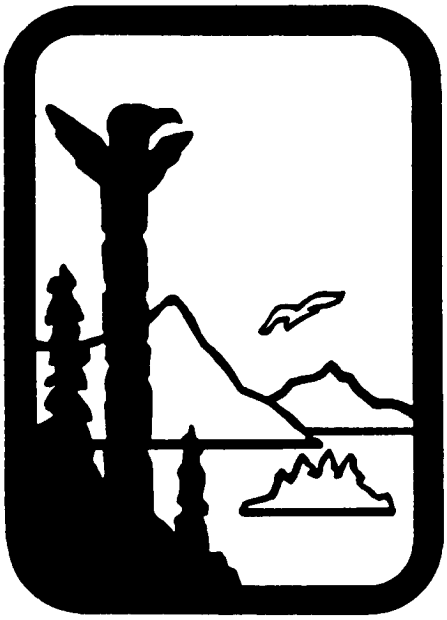
Alaska Department of Environmental Conservation



Amendments to:
State Air Quality Control Plan

Vol. III: Appendix III.D.5.10

{Appendix to Volume II. Analysis of Problems, Control Actions; Section III. Area-wide Pollutant Control Program; D. Particulate Matter; 5. Fairbanks North Star Borough PM2.5 Control Plan}

Adopted

December 24, 2014

Bill Walker
Governor

Larry Hartig
Commissioner

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Appendix III.D.5.10

Preliminary Summary of Fairbanks Firewood & Pellet Log Emission Measurements.

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sierra research

Preliminary Summary of Fairbanks Firewood & Pellet Log Emission Measurements

prepared for:

Alaska Department of Environmental Conservation

September 28, 2014

prepared by:

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Preliminary Summary of Fairbanks Firewood & Pellet Log Emission Measurements

- The Borough and State commissioned Dirigo Laboratories to measure PM emission benefits of burning locally produced pellet logs in Fairbanks.
- Fairbanks commissioned tests of (1) dry Fairbanks birch cordwood (20% moisture content), (2) pellet logs (7.5% moisture content), and (3) a 50/50 mix of cordwood and pellet logs in both a U.S. EPA certified stove and an uncertified stove.
- Dirigo followed EPA test procedures and measured PM emissions at both low-medium and high burn rates. Test results at low-medium burn rates (typical in Fairbanks and used to quantify emissions in the SIP inventory) showed the following:
    - Reductions in PM emissions for both the pellet logs and the mix relative to dry cordwood, ranged from 18% - 54%; and
    - 50/50 mix reductions were roughly twice those found for pellet logs, ranging from 40% - 54%.
- DEC commissioned tests of (1) wet Fairbanks birch cordwood (~40% moisture content) and (2) a 50/50 mix of wet cordwood and pellet logs. Test results at low-medium burn rates showed the 50/50 mix produced the following:
    - 64% reduction in PM emissions for both uncertified and certified stoves relative to wet cordwood.
- Because the tests showed variability in the low burn emission rates, additional tests are needed to confirm the results and assess benefits relative to spruce and other sources of cord wood (wet and dry) burned in Fairbanks.
- While the test results are based on limited samples, they indicate substantial emission reduction potential when the pellet logs are burned in combination with cord wood (wet or dry).
- The test results cannot be generalized to other “energy logs” because they are sensitive to the wood composition and moisture content of the product.
- A preliminary estimate of emission reductions that could be achieved through pellet log use was developed based on existing annual production capacity of 3,000 tons that could be expanded to 15,000 tons by 2019.
- A program targeting pellet log/cordwood mix use on unhealthy days (defined as days forecasted above 35 ug/m^3), which averaged 24 days/winter 2010 – 2013 at the State Office Building, was considered based on current and forecasted pellet log production capacity.
- Assuming a 60% compliance rate with such a targeted program by 2019, a 50/50 mix program would produce an additional 21.8% reduction in space heating PM emissions using 3,700 tons per/year, which is well below potential production capacity in 2019.